IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Sheehan
Application No.: 10/786,911 Art Unit: 2616
Filed: 2/25/04 Examiner: Hailu, Kibrom
For: DATA TRANSFER TO NODES OF A COMMUNICATION NETWORK USING SELF-REPLICATING CODE

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Response to Office Action which Accompanies a Request for Continued Examination

Introductory Comments

In response to an Office action dated November 23, 2007, please enter the following amendments and consider the following remarks. This Response accompanies a Request for Continued Examination (RCE) under 37 C.F.R. § 1.114. The appropriate fee under 37 C.F.R. § 1.17(e) with be paid through electronic filing.

Amendments to the Claims

1. (Currently Amended) A method of operating a communication network to transfer data between nodes of the communication network, the communication network comprising a first node that includes first self-replicating code comprising software used in the data transfer, and also comprises at least a second node and a third node that do not initially include the software used in the data transfer, the method comprising the steps of:

executing the first self-replicating code in the first node to establish a communication channel with the ~~a~~ second node, to replicate the first self-replicating code to generate second self-replicating code comprising the software used in the data transfer, and to provide the second self-replicating code to the second node over the communication channel;

executing the second self-replicating code in the second node to establish the communication channel with the ~~a~~ third node, to replicate the second self-replicating code to generate third self-replicating code comprising the software used in the data transfer, and to provide the third self-replicating code to the third node over the communication channel;

receiving streaming data for the data transfer in the second node from the first node over the communication channel and executing the second self-replicating code in the second node to handle the streaming data; and

receiving the streaming data in the third node from the second node over the communication channel and executing the third self-replicating code in the third node to handle the streaming data.

2. (Currently Amended) The method of claim 1 further comprising the steps of:

executing the second self-replicating code in the second node to establish the communication channel with a fourth node, to replicate the second self-replicating code to generate fourth self-replicating code comprising the software used in the data transfer, and to provide the fourth self-replicating code to the fourth node over the communication channel; and

receiving the streaming data in the fourth node from the second node over the communication channel and executing the fourth self-replicating code in the fourth node to handle the streaming data.

3. (Currently Amended) The method of claim 1 wherein the step of executing the second self-replicating code in the second node to handle the streaming data further comprises the step of:

executing the second self-replicating code in the second node to replicate the streaming data received from the first node, and to route the replicated streaming data to a payload process in the second node.

4. (Currently Amended) The method of claim 3 further comprising the step of:

executing the payload process in the second node to receive the replicated streaming data and process the replicated streaming data locally on the second node.

5. (Original) The method of claim 4 further comprising the step of:

executing the payload process in the second node to generate output data.

6. (Currently Amended) The method of claim 5 further comprising the step of:

executing the second self-replicating code in the second node to multiplex the output data and status information from the second node and forward the output data and the status information over the communication channel to the first node.

7. (Currently Amended) The method of claim 6 further comprising the step of:

receiving control information in the second node from the first node over the communication channel and using the control information in the second node to handle the streaming data.

8. (Currently Amended) The method of claim ~~1~~ 7 further comprising the step of:

routing the streaming data and the control information from the second node to the third node over the communication channel.

9. (Currently Amended) The method of claim 1 wherein the first self-replicating code comprises a streaming worm.

10. (Original) The method of claim 1 wherein the second node is remote from the first node and the third node is remote from the second node.

11. (Currently Amended) A communication network that provides for the transfer of data between nodes of the communication network, the communication network comprising:

a first node that includes first self-replicating code comprising software used in the data transfer;

a second node that does not initially include the software used in the data transfer; and

a third node that does not initially include the software used in the data transfer;

the first node, responsive to executing the first self-replicating code, establishes a communication channel with the second node, replicates the first self-replicating code to generate second self-replicating code comprising the software used in the data transfer, and provides the second self-replicating code to the second node over the communication channel;

the second node, responsive to executing the second self-replicating code, establishes the communication channel with the third node, replicates the second self-replicating code to generate third self-replicating code comprising the software used in the data transfer, and provides the third self-replicating code to the third node over the communication channel;

the second node receives streaming data from the first node over the communication channel and executes the second self-replicating code to handle the streaming data; and

the third node receives the streaming data from the second node over the communication channel and executes the third self-replicating code to handle the streaming data.

12. (Currently Amended) The communication network of claim 11 further comprising a fourth node, wherein:

the second node, responsive to executing the second self-replicating code, establishes the communication channel with the fourth node, replicates the second self-replicating code to generate fourth self-replicating code comprising the software used in the data transfer, and provides the fourth self-replicating code to the fourth node over the communication channel; and

the fourth node receives the streaming data from the second node over the communication channel and executes the fourth self-replicating code to handle the streaming data.

13. (Currently Amended) The communication network of claim 11 wherein the second node receives the streaming data from the first node over the communication channel, replicates the streaming data, and routes the replicated streaming data to a payload process in the second node.

14. (Currently Amended) The communication network of claim 13 wherein the second node, responsive to executing the payload process, receives the replicated streaming data and processes the replicated streaming data locally.

15. (Original) The communication network of claim 14 wherein the second node generates output data responsive to executing the payload process.

16. (Currently Amended) The communication network of claim 15 wherein the second node, responsive to executing the second self-replicating code, multiplexes the output data and status information from the second node, and forwards the output data and status information over the communication channel to the first node.

17. (Currently Amended) The communication network of claim 11 wherein the second node receives control information from the first node over the communication channel and uses the control information to handle the streaming data.

18. (Currently Amended) The communication network of claim 17 wherein the second node routes the data and the control information to the third node over the communication channel.

19. (Currently Amended) The communication network of claim 11 wherein the first self-replicating code comprises a streaming worm.

20. (Original) The communication network of claim 11 wherein the second node is remote from the first node and the third node is remote from the second node.

Remarks

Claims 1-20 are pending, and claims 1-20 stand rejected. The Applicants have amended claims 1-4, 6-9, 1-14, and 16-19. The Applicants respectfully traverse the rejection set forth by the Examiner.

Amendments to the Claims

The Applicants have amended the claims to clarify some of the limitations. One of the amendments is to clarify that the code being transferred and executed on the nodes of a communication network is self-replicating code that comprises software used in a data transfer. Support for these amendments may be found generally in the summary of the specification as filed, and on page 8, lines 24-27. Another one of the amendments is to clarify that the second node and the third node (along with other subsequent nodes) do not initially have the software that is used for the data transfer. Support for these amendments may be found generally in the summary of the specification as filed, and on page 6, lines 30-32. Another one of the amendments is to clarify that the data being transferred between the nodes is streaming data. Support for these amendments may be found on page 8, lines 24-30.

35 USC § 102 Rejection

The Examiner has rejected claims 1-20 under 35 USC § 102(e) as being anticipated by U.S. Patent 6,782,398 (Bahl). The Applicants submit that claims 1-20 are novel over Bahl for at least the reasons set forth below.

The method recited in claim 1 is used for a data transfer among nodes of a communication network. The communication network includes a first node and at least a second node and a third node. The first node includes self-replicating code that comprises software used in a data transfer. The second node and the third node do not initially include the software used in the data transfer. To perform the data transfer amongst the nodes, the first node executes the first self-replicating code to establish a communication channel with the second node. The first node also executes the first self-replicating code to replicate the first self-replicating code to generate second self-replicating code. The second self-replicating code comprises the software used in the data transfer. The first node then provides the second self-replicating code to the

second node over the established communication channel. The second node then executes the second self-replicating code to establish a communication channel with the third node. The second node also executes the second self-replicating code to replicate the second self-replicating code to generate third self-replicating code. The third self-replicating code comprises the software used in the data transfer. The second node then provides the third self-replicating code to the third node over the established communication channel.

When the self-replicating code has been transmitted to the second and third nodes, these nodes are able to handle a data transfer. Thus, the first node may transmit streaming data to the second node. The second node receives the streaming data over the communication channel, and executes the second self-replicating code to the handle the data. Similarly, the third node receives the streaming data from the second node over the communication channel, and executes the third self-replicating code to the handle the data.

The method recited in claim 1 advantageously provides a fast and efficient way of performing a data transfer among nodes of a network, such as a LAN. Because self-replicating code is used, the nodes of the network, such as the second node and the third node, do not need to have pre-installed software to handle the data transfer. The self-replicating code propagates through the nodes of the network to provide the nodes with the software used to handle the subsequent data transfer. When the nodes of the network have received the software used to handle the data transfer, data may be streamed between the nodes of the network using the software.

The Applicants submit that Bahl describes a method very different than that recited in claim 1 of the pending application. Bahl describes a method of maintaining common data sets (i.e., common databases) among a network of computers using replicated commands. The network of computers has update paths (see column 4, lines 56-59) established between the computers. If one computer executes a command to make a change to its data set, then that computer replicates the command and sends the replicated command to one or more computers on the network (see column 4, lines 59-63). The computers that receive the replicated command execute the command to make the same change to their data set, and possibly send the replicated command to other computers (see column 4, lines 63-67).

The method described in Bahl is different than the method of claim 1 in a number of ways. First, Bahl describes replicating a "command" and propagating the command throughout

the network. Claim 1 describes replicating "code comprising software used in the data transfer" and propagating this code throughout the network. The Applicants submit that replicating a "command" is much different than replicating "code comprising software used for a data transfer". Software comprises instructions that control how a piece of hardware works. Part of the instructions is definitions of commands. For example, if a command exists called "clear", then the instructions of the software will define what steps need to be executed by the hardware responsive to a clear command. Thus, software includes command definitions and other instructions, but a command is not understood by those skilled in the art as software.

In Bahl, the computers of the network each have the appropriate software to update their data sets. In other words, each computer has pre-existing software instructions that define commands. The computers in Bahl then merely transmit a replicated command to each other so that the command may be executed based on the pre-existing command definitions to update their locally-stored data sets.

In claim 1, the second node and the third node do not initially have the software used for the data transfer. Thus, these nodes do not have the commands or the definitions of the commands needed to handle a data transfer. Thus, if the second node or the third node were to receive a command as suggested in Bahl, these nodes would not have the command definitions available to understand the command. Before commands can be understood by the second and third node in claim 1, the appropriate software has to be propagated to these nodes. This is performed using self-replicating code. The first node executes the first self-replicating code to generate second self-replicating code, and provides the second self-replicating code to the second node. The second self-replicating code comprises the software used for the data transfer, which means the second self-replicating code includes both the desired commands and the definitions of the commands. The second node is then able to handle a subsequent data transfer by executing the second self-replicating code. A similar process is performed to provide third self-replicating code so that the third node is able to handle a subsequent data transfer by executing the third self-replicating code.

The Applicants submit that Bahl does not teach such a process. Each computer in Bahl is assumed to have the appropriate software and command definitions previously installed. Thus, they can share replicated commands that are understood by the pre-installed software in order to synchronize their data sets. There is no suggestion in Bahl that the software used to interpret the

commands need to be propagated in a self-replicating fashion throughout the network before the commands can be shared amongst the computers. Thus, the Applicants submit that Bahl does not teach the following limitations of claim 1: "executing the first self-replicating code in the first node… to replicate the first self-replicating code to generate second self-replicating code comprising the software used in the data transfer, and to provide the second self-replicating code to the second node over the communication channel" and "executing the second self-replicating code in the second node… to replicate the second self-replicating code to generate third self-replicating code comprising the software used in the data transfer, and to provide the third self-replicating code to the third node over the communication channel".

Secondly, Bahl describes a method for sharing commands between computers. Sharing commands as describe in Bahl is a store and forward transmission (i.e., one computer receives the command, executes the command, and then determines whether to forward the command onto another computer). The method in claim 1 describes streaming data from node to node in the network. The Applicants submit that Bahl does not teach streaming data as recited in claim 1.

Further, the Applicants maintain that the Examiner cannot read Bahl as describing both transmitting self-replicating code and transmitting data. It is one or the other in Bahl. When a change to a database is made in a computer in Bahl, the computer replicates the change (i.e., through a command), and transmits the change to one or more other computers. The computers receiving the change execute the pre-installed software to make the same change. In claim 1, in order to provide for a data transfer between nodes of the network, the self-replicating code is first propagated throughout the nodes of the network so that the nodes have the software to handle the data. Then, the data is streamed from node to node using the software that was transmitted to the nodes. Bahl does not teach or reasonably suggest that software to handle a data transfer is first propagated throughout the network to the nodes, and then the data may be streamed between the nodes. Bahl only describes transmitting the same change to a database amongst the nodes. If the Examiner maintains that the transfer of a database change in Bahl is comparable to the transfer of self-replicating code of claim 1, then the Applicants submit that Bahl does not teach the transfer of streaming data as recited in claim 1. If the Examiner maintains that the transfer of a database change in Bahl is comparable to the transfer of streaming data of claim 1, then the Applicants submit that Bahl does not teach the transfer of self-replicating code as recited in claim 1.

For at least the reasons provided above, the Applicants submit that claim 1 is novel over Bahl. The Applicants further submit that independent claim 11 and the dependent claims are novel for the similar reasons.

Conclusion

The Applicants submit that the pending claims are novel for at least the reasons provided above. The Applicants thus respectfully ask the Examiner to allow claims 1-20.

Respectfully submitted,

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